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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,790	03/22/2004	Young-Churl Bang	5000-1-545	9942
33942	7590	04/13/2006	EXAMINER	
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			STARK, JARRETT J	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/805,790

Applicant(s)

BANG ET AL.

Examiner

Jarrett J. Stark

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 7-10 is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of Group I, claims 1-10, in the reply filed on 4/4/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the masks and windows aligned in parallel to the [100] crystalline plane must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The crystalline plane is not defined compared to the masks/windows in the drawing. As the current wording of the claims read, the orientation of the plane could be parallel to the top/bottom of window/mask while being perpendicular to the sides of window/mask or in the alternative perpendicular to the top/bottom of window/mask while being parallel to the sides of window/mask.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Allowable Subject Matter***

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-10 are allowed.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Itagaki et al. (US 5,28,215).

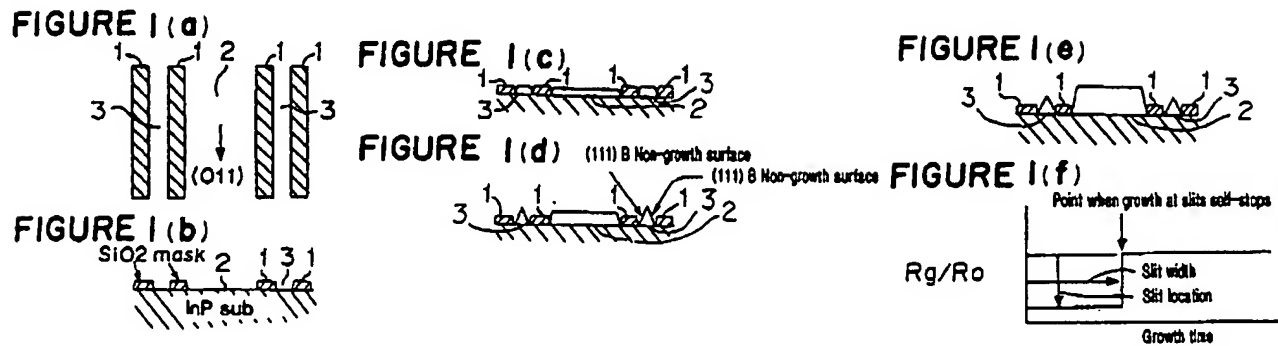
Regarding claim 1, Itagaki discloses a method of growing a semiconductor layer in a selective area by MOCVD (Metal Organic Chemical Vapor Deposition), comprising the steps of:

(a) forming, a first mask pattern on a semiconductor substrate having a (100) crystalline plane, said first mask pattern having a first window wider than the selective area; (Itagaki, Col. 2 Lines 26-45 & Claim 1) \*\*NOTE: Figures shown below show the mask alignment not the crystalline plane of the substrate which is (100)\*\*

(b) forming a second mask pattern having both a second window and a third window, the second window being defined by spacing of the second mask pattern from the first mask pattern, in correspondence with a blocking area for blocking the surface migration of a III-group semiconductor source gases at edges of the first window, and the third window being as wide as the selective area; and (Itagaki Figs. 1(a-f))

(c) growing the semiconductor layer by MOCVD on the semiconductor substrate exposed by the second and third windows. (Itagaki Figs. 1(a-f) shown below)

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### Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 2-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Itagaki et al. (US 5,28,215) in view of Barnett et al. (US 4,876,210).

**Regarding claim 2,** Itagaki discloses the method of claim 1.

Itagaki does not expressly disclose wherein the first and second mask patterns and the first, second and third windows are formed in parallel to the (100) crystalline plane of the semiconductor substrate.

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Barnett discloses wherein the first and second mask patterns and the first, second and third windows are formed in parallel to the (100) crystalline plane of the semiconductor substrate.

The two references are analogous art because they are from the same field of endeavor which is the method of Selective Area Growth using MOCVD. At the time of the invention, it would have been obvious to a person of ordinary skill in the art align the mask patterns and windows in parallel to the (100) crystalline plane of the semiconductor substrate.

The suggestion/motivation would have been Barnett, Col. 7 lines 47-56. Barnett teaches that the best growth occurs when the masks are parallel to the "natural cleavage plane." The natural cleavage plane is always along the crystalline plane. Therefore, it would have been obvious to combine Barnett with Itagaki to obtain the invention as specified.

Second, the selective growth mask must optimize lateral overgrowth while minimizing substrate/grown layer contact area. The minimized contact area will reduce vertical defect propagation and thermally generated stress in the Ge layer. A pattern that generates parallel lateral growth faces which coalesce uniformly would facilitate complete fill-in growth. Therefore, a selective growth mask of parallel lines was used for further Ge growth on Si. The lines were oriented parallel to one side of a natural cleavage plane.

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**Regarding claim 3, Itagaki in view Barnett of disclose the method of claim 1,** wherein the first and second mask patterns and the first, second and third windows are formed in parallel to the (100) crystalline plane of the semiconductor substrate. (see regarding claim 2)

**Regarding claim 3, Itagaki in view Barnett of disclose the method of claim 2,** wherein step (b) includes forming the second mask pattern such that at least one pair of second windows are defined, for forming at least one pair of blocking areas, and the thickness of the semiconductor layer grown in the selective area is controlled by adjusting a number or width of the second windows. (Itagaki, Col. 2 Lines 26-45, Itagaki teaches that the growth rate is controlled by widths of the slits, see figure 1(a))

**Regarding claim 4, Itagaki in view Barnett of disclose the method of claim 1,** wherein the semiconductor layer grown in the selective area is an active layer. It is inherent that the layer being grown by Itagaki, in the selective area is an active layer. (Itagaki, Col. 2 Lines 5-7)

In regards to “ for an SSC-LD (Spot-Size Converter integrated Laser Diode.” This statement is given no patentable weight. It merely states, for example, the purpose or intended use of the invention, rather than any distinct limitation. Therefore the intended use statement is not considered a limitation and is of no significance to claim construction.

**Regarding claim 5, Itagaki in view Barnett of disclose the method of claim 1,** wherein the semiconductor layer grown in the selective area is formed of AlGaInAs.

Barnet teaches the use of MOCVD to AlGaAs on an Si substrate. Itagaki is not specific on the compounds that can be used, Itagaki merely discloses group III-V compounds grown on an InP substrate. AlGaAs is a group III-V compounds. By combining the teachings of Barnet and Itagaki, using an InP substrate and a AlGaAs source the layer grown would obviously be AlGaInAs due to the migration of In during MOCVD.

Also, it is notoriously well known to use MOCVD to manufacture AlGaInAs semiconductor lasers. Please see the reference Hayakawa listed on Form-892.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jarrett J. Stark whose telephone number is (571) 272-6005. The examiner can normally be reached on Monday - Thursday 7:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JJS

April 9, 2006 S



**W. DAVID COLEMAN  
PRIMARY EXAMINER**